

REMARKS

By the present amendment, claims 83, 84, 100 and 104 have been cancelled, claims 41-45, 47, 48, 54, 56-61, 82, 91, 93, 94, 97, 98, 102, 105-107, 109 and 112 have been amended, and no new claims have been added. Cancelled dependent claims 100 and 104 have been re-presented in independent form, as claims 98 and 102, respectively. Accordingly, claims 1-82, 85-99, 101-103 and 105-112 are presently pending, and favorable reconsideration thereof is respectfully requested. Claims 1, 40, 80-82, 85, 89, 95-98, 102, and 107-112 are the independent claims.

Applicant wishes to thank the Examiner for the careful review of the present application and the prior art.

35 U.S.C. § 112, 2nd paragraph

Claims 1, 40, 80, 81, 85, 89, 95, 96, 98, 102 and 107-111

The Examiner has rejected claims 1, 81, 85, 98, 108 and 111 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, on the ground that the measurement method lacks transmitting steps to supply the scattered laser and radar radiation.

Similarly, the Examiner has rejected claims 40, 80, 89, 102, 107, 109 and 110 as indefinite and unclear in that the measurement system lacks transmitting means to supply the scattered laser and radar radiation. The Examiner has rejected claim 95 as indefinite and unclear in that it lacks clearly claimed transmitting and receiving means to produce the data from a scattered laser pulse. Likewise, the Examiner has rejected claim 96 as indefinite and unclear in that there is no clearly set forth code to transmit and receive laser pulses to supply the data as claimed.

Applicant respectfully submits that each of these claims complies with 35 U.S.C. § 112, 2nd paragraph. With reference to independent claim 1, for example, independent claim 1 recites an environment measurement method comprising:

- receiving first signals produced in response to a laser beam scattered by said environment;
- receiving second signals produced in response to a radar beam scattered by said environment; and
- storing data representing said first and second signals, for use in producing a representation of said environment.

The additional transmitting steps to which the Examiner has referred are presently recited in various dependent claims, including claims 3 and 12, for example. In claim 1, however, Applicant has chosen to define the invention more broadly than in these dependent claims, so that an entity that performs the recited steps of receiving and storing falls within the scope of the claim, even if that entity is not the same entity that transmitted the incident laser and radar beams to the environment to produce the scattered laser and radar beams.

Applicant respectfully notes that breadth of a claim is not to be equated with indefiniteness: *In re Miller*, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). As stated in M.P.E.P. § 2173.04, “If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. 112, second paragraph.”

In the present case, Applicant respectfully submits that the scope of the subject-matter embraced by claim 1, although broader than claim 3 or 12 for example, is clear. In addition, Applicant has not otherwise indicated that he intended the invention to be of a scope different from that defined in the claims. In this regard, various passages in Applicant’s specification (such as the Summary at page 3, lines 8-14; the detailed description at page 14, lines 2-21, and the Abstract, lines 2-7, for example) confirm that the applicant viewed the scope of the invention as being at least as broad as that defined in claim 1. Accordingly, Applicant respectfully submits that claim 1 complies

with 35 U.S.C. § 112, 2nd paragraph, and respectfully requests that the rejection of claim 1 be withdrawn.

For reasons similar to those presented in connection with claim 1, Applicant respectfully submits that claims 40, 80, 81, 85, 89, 95, 96, 98, 102 and 107-111 also comply with 35 U.S.C. § 112, 2nd paragraph, and respectfully requests that the rejection of these claims be withdrawn.

Claims 82, 97 and 112

The Examiner has rejected claims 82, 97 and 112 as indefinite and unclear in that they fail to claim a method, apparatus, or a computer-program product.

By the present amendment, claims 82, 97 and 112 have been amended to recite “A signal embodied in a propagation medium ...” Applicant respectfully submits that claims 82, 97 and 112 as amended are directed to a computer-program product. Applicant respectfully notes that a large number of issued United States patents, such as recently-issued U.S. Patent No. 6,549,929 to Sullivan for example, include claims having similar preambles. Applicant therefore respectfully submits that the rejection of claims 82, 97 and 112 is overcome.

Claim 109

The Examiner has rejected independent claim 109 as indefinite and unclear in that it is a single-means claim. Applicant respectfully notes that claim 109 does not expressly recite the word “means”, and is therefore subject to a presumption that it is not a means-plus-function claim. Nevertheless, by the present amendment, Applicant has amended claim 109 to additionally recite a memory device in communication with the processor circuit. Applicant therefore respectfully submits that the rejection of claim 109 is overcome.

Claim 83

The Examiner has rejected claim 83 as indefinite and unclear in that it recites a data structure without reciting a medium. By the present amendment, claim 83 has been cancelled. Applicant therefore respectfully submits that the rejection is overcome.

Claims 1-112, “configured to”

The Examiner has expressed the view that throughout claims 1-112, the uses of the phrase “configured to” make the claims indefinite and unclear in that the claims fail to set forth clearly and definitely what configuration is claimed that achieves the desired function or results. The Examiner has given a single example, claim 72, which recites that “... said representation processing circuit is configured to apply a migration algorithm to said data representing said second signals ...”

Applicant respectfully notes that the test for definiteness under 35 U.S.C. § 112, 2nd paragraph is whether “those skilled in the art would understand what is claimed when the claim is read in light of the specification.” *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986); M.P.E.P. § 2173.02 [emphasis added].

Applicant respectfully submits that when the claims are read in light of the specification, the use of the phrase “configured to” does not render the claims indefinite or unclear. For example, with respect to claim 72 upon which the Examiner has specifically commented, Applicant’s specification, at page 71, lines 23-25, and at page 82 line 26 to page 83 line 3, indicates that it is the analysis routine 320, and more particularly a block 620 of codes thereof, which configures the representation processing circuit to carry out the functionality recited in claim 72. More generally, from the foregoing passage and other passages in Applicant’s specification (such as page 57, line 6 and page 69, line 7, for example), in the preferred embodiment in which the processor circuit 54 includes a microprocessor, one of ordinary skill in the art would understand that the processor circuit may be configured by routines comprising blocks of instruction codes. (Alternatively, however, Applicant’s specification has described numerous types of processor circuits other than microprocessors (see for example page 45, lines 12-19), and it is submitted that other ways of configuring such an alternative processor circuit are known to those of ordinary skill in the art.)

Accordingly, Applicant respectfully submits that the phrase “configured to” does not render any of claims 1-112 indefinite or unclear, and respectfully requests that this ground of rejection be withdrawn.

Claims 1-112: “operable to”

The Examiner has expressed the view that throughout claims 1-112, the use of the phrase “operable to” makes the claims indefinite unclear. The Examiner has given a single example, claim 41, in respect of which the Examiner has indicated that it is unclear how “operable to receive” differs from simply “to receive” in context.

By the present amendment, Applicant has amended claim 41 as suggested by the Examiner. Applicant has also made similar amendments to claims 42-45, 47, 48, 54, 56-61, 91, 93, 94, 102, and 105-106, thereby removing the word “operable” from the claims. Applicant therefore respectfully submits that the rejection of these claims is overcome.

Claims 1-112: “migration algorithm”

The Examiner has expressed the view that throughout claims 1-112, the use of the phrase “migration algorithm” is indefinite and unclear. Applicant notes for the Examiner’s reference that this term is recited in claims 33, 72 and 108-112. The Examiner has referred to 37 C.F.R. § 1.75(d)(1), which provides as follows:

(d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. (See § 1.58(a)).

Applicant respectfully notes that the term “migration algorithm” has clear support in the description as required by 37 C.F.R. § 1.75(d)(1). In this regard, the purpose and underlying principles of a migration algorithm, as well as a specific practical application of such an algorithm in the context of the preferred embodiment, are described at page 82, line 26 to page 89, line 13 of Applicant’s specification. Applicant respectfully submits that claims 33, 72 and 108-112, when read in the light

of the specification (cf – M.P.E.P. § 2173.02 and *Orthokinetics*, discussed above in connection with the phrase “configured to”), are not indefinite or unclear, and respectfully requests that this ground of rejection be withdrawn.

Dependent Claims

The Examiner has noted that dependent claims 2-39, 41-79, 84, 86-88, 90-94, 99-101 and 103-106 are unclear in that they depend from unclear independent claims.

Claims 84, 100 and 104 have been cancelled, and therefore, the rejection of these claims is overcome.

In view of the foregoing remarks and/or amendments in relation to the various independent claims under the preceding sub-headings, Applicant respectfully submits that the independent claims are not unclear. Applicant therefore respectfully submits that dependent claims 2-39, 41-79, 86-88, 90-94, 99, 101, 103, 105 and 106 do not depend from unclear independent claims.

37 C.F.R. § 1.71 and 35 U.S.C. § 112, 1st paragraph: claim 109

The Examiner has objected to the specification under 37 C.F.R. § 1.71, on the ground that independent claim 109 is a single-means claim. The Examiner has also rejected claim 109 under 35 U.S.C. § 112, 1st paragraph, for the same reason.

As noted above, claim 109 does not use the term “means” and is therefore subject to a presumption that it is not a means-plus-function claim. Nevertheless, by the present amendment, claim 109 has been amended to further recite a memory device in communication with the processor circuit. Applicant therefore respectfully submits that this ground of rejection is overcome.

35 U.S.C. § 101

The Examiner has rejected claims **82, 83, 84, 97 and 112** under **35 U.S.C. § 101** as being directed to non-statutory subject-matter.

With respect to claims **82, 97 and 112**, the Examiner has indicated that these signal claims require a computer-readable medium. By the present amendment, Applicant has amended independent claims **82, 97 and 112** to recite “A signal embodied in a propagation medium ...”. Applicant respectfully notes in passing that a significant number of issued U.S. patents, such as recently-issued U.S. Patent No. **6,549,929** to Sullivan for example, include claims having similar preambles. Applicant respectfully submits that amended claims **82, 97 and 112** comply with **35 U.S.C. § 101**, and therefore respectfully submits that this ground of rejection is overcome.

Claims **83 and 84** have been cancelled, and therefore, the rejection of these claims is overcome.

35 U.S.C. § 102(b):

The Examiner has rejected claims **1-4, 8-12, 14, 18, 19, 21, 24, 26, 32, 34-43, 46-51, 53, 63, 65, 71, 73, 74-81, 65-87, 89-93, 95, 96, 98-100, 102-105 and 107-111** under **35 U.S.C. § 102(b)** as being anticipated by Vickers (U.S. Patent **4,495,500**).

Claims **100 and 104** have been cancelled, and therefore, the rejection of these claims is overcome.

In interpreting the Vickers reference, the Examiner has expressed the view that the term “radar” is commonly used in the art as including lidar and that the term used for lidar is “laser radar”. The Examiner has pointed to the title of Leonard et al. (U.S. Patent **6,137,566**) as an example of the usage of the term “laser radar”. Thus, the Examiner has expressed the view that the term “radar” is read broadly in Vickers to include both RF radar and laser radar.

Applicant (who is also the inventor of the Vickers reference) respectfully disagrees with the Examiner's interpretation of the term "radar" as used in the Vickers reference. Applicant respectfully notes that the word "RADAR" is an acronym for "RAdio Detection And Ranging" (see e.g. *Chambers Dictionary of Science and Technology* (Edinburgh: W&R Chambers Ltd., 1974), p.969), whereas the term "LIDAR" is an acronym for "LIght Detection And Ranging" (see e.g. *Chambers Dictionary, supra*, page 685; see also page 2, lines 14-15 of Applicant's specification). Thus, "radar" uses radio waves, whereas "lidar" uses visible or near-visible (typically infrared) light. The term "laser radar" as employed in the Leonard patent is both contradictory and nonsensical, and does not reflect proper or common usage in the technical art to which the present invention pertains. Applicant therefore respectfully submits that the term "radar" as used in the Vickers patent has the same meaning as its accepted acronym, namely, radio detection and ranging, and therefore does not include laser detection and ranging. In any event, as discussed below, the meaning of the term "radar" in the Vickers reference is not of critical importance, as it is the Applicant's submission that claim 1 is not anticipated by Vickers, irrespective of any meaning that the Examiner may attribute to the word "radar" in general.

Applicant respectfully submits that the Vickers reference fails to satisfy the requirements for a finding of anticipation of claim 1. The standard for an anticipation rejection under 35 U.S.C. §102 has been well established by the Court of Appeals for the Federal Circuit, as reproduced in M.P.E.P. § 2131 as follows:

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q. 2d 1913 (Fed. Cir. 1989).

" 'For a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference.' ... These elements must be arranged as in the claim under review ... but this is not an 'ipsissimis verbis' test ..." *In re Bond*, 15 U.S.P.Q. 2d 1566, 1567 (Fed. Cir. 1990).

Vickers discloses a topographic data gathering method and system. The system includes equipment mounted in an aircraft, including a low frequency radar, an altimeter, temperature and humidity sensors, a clock, and a digital recorder. The system also includes a second radar operating at a different frequency than the first radar. The first (low-frequency) radar system includes a first RF source 32 which produces a continuous carrier wave at about 200 MHz, which is applied to a modulator 34 which produces pulses no longer than about two cycles of the carrier wave. The pulses produced by the modulator are amplified by a power amplifier which drives a transmitting antenna 38 to direct 200 MHz radio frequency pulses downward toward the ground. A receiving antenna 40 is similarly mounted to receive the reflected radio frequency pulses. The second radar system includes an RF source 50 which produces a carrier wave at a relatively high frequency, for example, 400 MHz, which is also applied to a modulator 52 to produce a two-cycle pulse, which is then amplified and transmitted by an antenna 56 toward the ground, and the reflected radio waves are received by a receiving antenna 58. Vickers also refers to an experimental 300 MHz return signal. See generally Vickers, col. 5 lines 3-43, col. 7 line 65 and Fig. 3.

Claim 1 recites an environment measurement method comprising:

receiving first signals produced in response to a laser beam scattered by said environment;

...

Vickers discloses only the use of radio frequencies, namely, 200 MHz, 300 MHz and 400 MHz. Vickers fails to disclose the use of laser beams. Accordingly, Vickers fails to disclose “receiving first signals produced in response to a laser beam scattered by said environment”, as recited in claim 1. Accordingly, the Vickers reference fails to satisfy the requirements for a finding of anticipation of claim 1.

Applicant further respectfully notes that Vickers does not “inherently” disclose the limitations of claim 1. In this regard, as discussed in M.P.E.P. § 2112, the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient

to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993)...; *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’ ” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). In the present case, Vickers does not disclose any means of producing a laser beam, but rather, merely discloses radio-wave transmitting antennae 38 and 56, and radio-wave receiving antennae 40 and 58. It would not be possible to produce a laser beam with the system disclosed by Vickers et al., nor would it be possible to receive “signals produced in response to a laser beam scattered by said environment”, as recited in claim 1. Accordingly, Applicant respectfully submits that these limitations are not inherently disclosed in Vickers.

In view of the foregoing, Applicant respectfully submits that the Vickers reference fails to satisfy the requirements for a finding of anticipation of claim 1, and respectfully requests that the rejection of claim 1 be withdrawn.

Claims 2-4, 8-12, 14, 18, 19, 21, 24, 26, 32 and 34-39 are directly or indirectly dependent upon claim 1. Applicant therefore respectfully submits that these claims are allowable due to their dependencies, as well as the additional subject-matter each of these claims recites.

The Examiner has stated that his remarks with respect to claims 40-43, 46-51, 53, 63, 65, 71, 73, 74-81, 85-87, 89-93, 95, 96, 98-100, 102-105, 107-111 are substantially those just made with reference to claims 1-4, 8-12, 14, 18, 19, 21, 24, 26, 32, 34-39.

Accordingly, Applicant respectfully submits that claims 40-43, 46-51, 53, 63, 65, 71, 73, 74-81, 85-87, 89-93, 95 and 96 are allowable for reasons similar to those presented above in connection with claims 1-4, 8-12, 14, 18, 19, 21, 24, 26, 32 and 34-39.

Independent claim **98** now re-presents former dependent claim **100** in independent form, and thus recites an environment measurement method comprising:

producing signals in response to a radar beam scattered by said environment and received at an airborne receiver, said radar beam having a wavelength of at least on the order of one meter, wherein producing signals comprises continuously producing data signals in response to scattered portions of a radar pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions;

...

Applicant respectfully submits that Vickers fails to disclose “continuously producing data signals in response to scattered portions of a radar pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions”, as recited in claim **98**. Applicant therefore respectfully submits that Vickers fails to satisfy the requirements for a finding of anticipation of claim **98**, and respectfully requests that the rejection of claim **98** be withdrawn.

Claim **99** is dependent upon claim **98**. Applicant therefore respectfully submits that claim **99** is allowable due to its dependency, as well as the additional subject-matter it recites.

Independent claim **102** now re-presents dependent claim **104** in independent form, except that the term “operable” has been deleted as suggested by the Examiner. Accordingly, claim **102** recites that “said airborne radar reception system is to continuously produce data signals in response to scattered portions of a radar pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions”. Applicant respectfully submits that claim **102** is allowable for reasons similar to those presented above in connection with claim **98**.

Claims 103 and 105 are dependent upon claim 102. Applicant therefore respectfully submits that these claims are allowable due to their dependencies, as well as the additional subject-matter each of these claims recites.

Claim 107 as amended recites an environment measurement system comprising:

means for producing signals in response to a radar beam scattered by said environment and received at an airborne receiver, said radar beam having a wavelength of at least on the order of one meter, wherein said means for producing signals comprises means for continuously producing data signals in response to scattered portions of a radar pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions; and

...

Applicant respectfully submits that claim 107 is allowable for reasons similar to those presented in connection with claim 98.

Independent claims 108-111 each effectively recite applying a migration algorithm to data (the data representing signals produced at an airborne receiver in response to a radar beam scattered by the environment), to associate said data with particular locations of the environment. Applicant respectfully notes that Vickers et al. fail to disclose or suggest the use of migration algorithms (such as those discussed in applicant's specification at pages 82-89 thereof). Accordingly, Vickers fails to satisfy the requirements for a finding of anticipation of claims 108-111. Applicant therefore respectfully requests that the rejection of these claims be withdrawn.

35 U.S.C. § 103(a)

The Examiner has rejected claims 13, 16, 17, 20, 29, 30, 52, 55-58, 60, 64, 68, 69, 101 and 106 under 35 U.S.C. § 103(a) as being unpatentable over Vickers (U.S. Patent No. 4,495,500).

Claims 13, 16, 17, 20, 29 and 30 are directly or indirectly dependent upon claim 1; claims 52, 55-58, 60, 64, 68 and 69 are directly or indirectly dependent upon claim

40; claim 101 is dependent upon claim 98; and claim 106 is dependent upon claim 102. In view of Applicant's submissions above, in which Applicant respectfully submits that claims 1, 40, 98 and 102 have been shown to be allowable, Applicant respectfully submits that claims 13, 16, 17, 20, 29, 30, 52, 55-58, 60, 64, 68, 69, 101 and 106 are allowable due to their dependencies, as well as the additional subject-matter each of these claims recites.

Claims Not Rejected on Prior Art

Applicant respectfully notes that no rejections under 35 U.S.C. § 102(b) or 103(a) were made in relation to claims 5-7, 15, 22, 23, 27, 28, 31, 33, 44, 45, 54, 59, 61, 62, 66, 67, 70, 72, 82, 83, 84, 88, 94, 97 or 112. Applicant respectfully requests the Examiner to confirm whether these claims are allowable, or alternatively, whether the various dependent claims would be allowable if re-written in independent form.

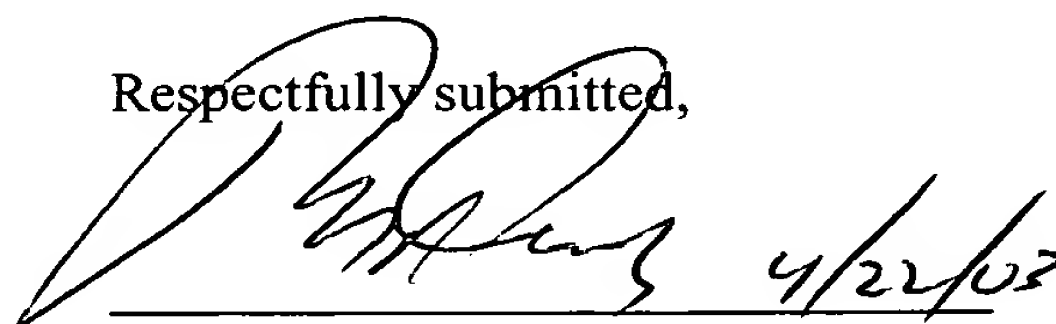
Information Disclosure Statement

Finally, Applicant encloses an Information Disclosure Statement, listing the prior art references from a partial International Search Report dated April 4, 2003 in connection with Applicant's corresponding Patent Cooperation Treaty application.

Conclusion

In view of the foregoing, Applicant respectfully submits that the present application is now in condition for allowance, and respectfully requests that a Notice of Allowance be issued.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "David S. Dowell", is written over a horizontal line. To the right of the signature, the date "4/22/03" is handwritten.

SJF:djo

Encls: Information Disclosure Statement
Form PTO-1449
Copies of prior art references

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